

Laboratory Fact Sheet: Guidelines for Work with Methylene Chloride

Scope: Methylene Chloride (also known as Dichloromethane; CAS# 75-09-2) is a colorless, volatile liquid with a sweet odor. It is commonly used as a solvent for thin layer chromatography. It is also used as a paint and varnish remover, solvent for plastics, degreasing agent, propellant, and blowing agent.

Chemical properties: Methylene Chloride is a combustible liquid. It reacts violently with oxidizing agents (such as perchlorates, peroxides, permanganates, chlorates, nitrates, chlorine, bromine and fluorine), chemically active metals (such as potassium, sodium, magnesium and aluminum), and strong bases (such as sodium hydroxide and potassium hydroxide).

Health Hazards: Methylene Chloride is a carcinogen and mutagen, showing adverse effects on the heart, central nervous system, liver, skin and eyes. Exposure can occur through inhalation, absorption, or skin contact.

Signs & Symptoms of Exposure:

Acute: Contact with Methylene Chloride can severely irritate and burn the skin and eyes with possible eye damage. Inhaling Methylene Chloride can irritate the nose, throat and lungs causing coughing, wheezing and/or shortness of breath. Higher exposure can cause headache, nausea, fatigue, dizziness, lightheadedness, weakness and unconsciousness.

Chronic: Methylene Chloride may be a carcinogen in humans since it has been shown to cause liver and lung cancer in animals. Repeated exposure may cause bronchitis to develop with coughing, phlegm, and/or shortness of breath. Methylene Chloride may damage the liver and affect the kidneys. Long-term exposure may affect the brain causing memory loss, poor coordination, and reduced thinking ability.

First Aid:

Eye Contact: Immediately flush with large amounts of water for at least 30 minutes, lifting upper and lower lids. Remove contact lenses, if worn, while flushing. Seek medical attention.

Skin Contact: Quickly remove contaminated clothing. Immediately wash contaminated skin with large amounts of soap and water.

Inhalation: Remove the person from exposure; begin rescue breathing (using universal precautions) if breathing has stopped and CPR if heart action has stopped. Transfer promptly to a medical facility.

Workplace Exposure Limits: The OSHA 1910.1052 Permissible Exposure Limit (PEL) for Methylene Chloride is 25 ppm for 8 hours (TWA) or 125 ppm for 15 minutes (STEL).

Training: Any lab personnel using Methylene Chloride needs proper training on use, storage, spill/exposure procedures and have proper documentation. Please use our Site Specific Chemical Hazard training form to complete the necessary training. You can obtain this form by clicking on the link provided: <http://research.uthscsa.edu/safety/specifichazchemicaltrngform.pdf>

Personal Protective Equipment: The OSHA Personal Protective Equipment Standard (29 CFR 1910.132) requires employers to determine the appropriate personal protective equipment for each hazard and to train employees on how and when to use protective equipment.

The following recommendations are ONLY guidelines and may not apply to every situation.

Gloves and Clothing: Avoid skin contact with Methylene Chloride. Wear personal protective equipment made from material which cannot be permeated or degraded by this substance.

Safety equipment manufacturers recommend Polyvinyl Alcohol and Silver Shield/4H for gloves and Tychem Responder and TK; Zytron 500; ONESuit TEC; and Trelchem HPS and VPS, or the equivalent, as protective materials for clothing.

Eye Protection: Wear chemical safety goggles and/or a full face shield where splashing is possible. Maintain a proper working eyewash station near work area.

Respiratory Protection: Respirators should only be used if the employer has implemented a written program that takes into account workplace conditions, requirements for worker training, respirator fit testing, and medical exams, as described in the OSHA Respiratory Protection Standard (29 CFR 1910.134).

Where the potential exists for exposure over **25 ppm**, use a NIOSH approved supplied-air respirator with a full face piece operated in a pressure-demand or other positive-pressure mode. For increased protection use in combination with an auxiliary self-contained breathing apparatus operated in a pressure-demand or other positive-pressure mode.

Work Practice Controls:

Designate an area for working with Methylene Chloride, and label it as such.

Work should be planned so that glove contact will not occur. If small spills occur, lab personnel should avoid glove contact with Methylene Chloride. If glove contact does occur, remove gloves and wash hands immediately.

Keep containers closed as much as possible. Handle open containers only in a chemical fume hood.

Use in the smallest practical quantities for the experiment being performed.

Once work with Methylene Chloride is complete, wipe down work area with and soap and water solution.

Handling & Storage: A regulated, marked area should be established where Methylene Chloride is handled, used or stored as required by the OSHA Methylene Chloride Standard (29 CFR 1910.1052).

Keep in a tightly closed container, stored in a cool, dry, ventilated area away from metals and light. Isolate from any source of heat or ignition.

Methylene Chloride reacts violently with Oxidizing Agents (such as Perchlorates, Peroxides, Permanganates, Chlorates, Nitrates, Chlorine, Bromine and Fluorine); chemically active metals (such as Potassium, Sodium, Magnesium and Aluminum); and Strong Bases (such as Sodium Hydroxide and Potassium Hydroxide).

Methylene Chloride attacks some forms of plastic, rubber and coatings, and will corrode Iron, some Stainless Steels, Copper and Nickel in the presence of water.

Disposal Procedures: Collect all Methylene Chloride-containing wastes in a well labeled compatible (glass or PTFE-Teflon) container.

No Methylene Chloride (no matter how dilute) should be discarded down a sink.

Clearly label the container with the concentration of Methylene Chloride, and a warning statement (e.g. “health hazard: toxic”). When the container is full, please fill out an on-line chemical waste pick-up request form by visiting <http://research.uthscsa.edu/safety/>

Emergency & Spill Response:

- Evacuate personnel and secure and control entrance to the area.
- Stop or reduce the spill if it is safe to do so.
- Eliminate all ignition sources.
- Absorb liquids in vermiculite, dry sand earth, or a similar material and place into sealed containers.
- Use water spray to keep containers cool.
- Ventilate area of spill or leak.
- DO NOT wash into sink/sewer.
- Once spill has been contained, contact Environmental Health & Safety at 210-567-2955 and request an immediate pick-up of the containers of spilled product and contaminated absorbent material.

Medical Testing: Before first exposure and every 12 months thereafter, OSHA requires your employer to provide (for persons exposed to greater than 12.5 ppm of Methylene Chloride which is the “action limit”):

Complete work and medical history

Thorough physical examination

Liver and kidney function tests

If symptoms develop or overexposure is suspected, the following are recommended:

Lung function tests

Exam of the nervous system

Evaluate for brain effects such as changes in memory, concentration, sleeping patterns and mood, as well as for headaches and fatigue.

Seek medical attention. Provide a copy of MSDS. Contact UTHSCSA Employee Health & Wellness Clinic (210-567-2788) during normal business hours, or University Hospital Emergency Triage (210-358-2488) after normal business hours or on weekends.

Reference: New Jersey Department of Health & Senior Services, Right to Know Program. Web Address: <http://www.nj.gov/health/eoh/rtkweb>

For questions or concerns, please contact:

Environmental Health & Safety, 1.343T DTL

(210)567-2955

<http://research.uthscsa.edu/safety>